TELDAT G1N

IP Router with integrated EDGE /GPRS interface for business-critical applications

“Provides with a 2.5G Access for remote applications to implement the highest quality reliable cellular VPN services together with high availability”.

The Teldat G1N router allows remotely situated M2M applications to share an EDGE/GPRS access for a safe and manageable interconnection with the control stations.

This device’s IP communication interfaces (EDGE/GPRS, Ethernet and optional WiFi) have achieved the maximum integration level combining its powerful hardware architecture and Teldat’s Internetworking Software (CIT), the true heart of the system. The CIT enriches the router’s IP interfaces with all the necessary advanced features to implement efficient communication services which at the same time are exceptionally secure and manageable.

PRODUCT

- Embedded EDGE/GPRS/GSM interface with double SIM (internal and external) and a port for external RF antennas.
- 4xEthernet 10/100M managed switch.
- Local console port (RS-232 without flow control) for emergency router recovery
- HW data encryption for maximum performance in VPN environments.
- Optional IEEE 802.11a/b/g WiFi support with configurable “Access Point” or “Client” role.
- Equipped with the Teldat Internetworking Software (CIT) for business applications: detailed management of its communication interfaces, Teldat commands console, real time debugging system, extensive support for IP protocols and advanced functionalities, centralized management.

APPLICATION SCENARIOS

1.- IP interconnection for business-critical applications (telemetering/telecontrol, stand-alone ATMs, sale points, etc.)

The figure on the left shows a remote location with M2M terminals interconnected to the Central Services headquarters to be remotely managed through EDGE/GPRS. When the Teldat G1N detects quality degradation in the main access, it immediately switches transmission to the WWAN2 network thus maintaining continuity in the management service.

The router can stay permanently connected to the WWAN network, always-on, or only connect when there is IP traffic to transmit through this link (on-demand).

2.- Interconnecting remote corporate offices: The Teldat G1N provides an IP Access for small branches that do not have fixed network coverage or this is only enabled for specific events (trade fairs, conferences, etc.). In this case the network schema is similar to the above diagram, except the router’s local devices are PCs, printers, ATMs or other office terminals.
3. 2.5G backup through an independent device:

In this figure the Teldat G1N serves as the backup device for a remote branch. The main router is coordinated with the Teldat G1N through a high availability protocol (VRRP or HSRP) so only one of them is the WAN access router at any time and share an IP address in the LAN used as the default gateway in the branch devices. When the main router detects an incident on its access line, the Teldat G1N takes over and transmits all the branch traffic over a cellular network.

ADVANTAGES

- **Embedded EDGE/GPRS** interface fully manageable by the router, suitable to be used 365x24.
- Standard RF antenna port to connect an antenna best suited to each location.
- **Mechanical protection against the SIM card being fraudulently used**: Accessing the internal SIM means the device has to be dismantled.
- **Auto-detection of WWAN incidences**: Three complementary detection mechanisms.
  - Active fault detection: Based on polling traffic. Optimum mechanism for flat rate WWAN services.
  - Passive fault detection: Activity is analyzed in response to branch traffic transmitted via WWAN. Optimum for WWAN services charged by traffic.
  - Quality degradation detection: Analysis of latency, jitter and packet error rate in the WWAN service. Optimum for service in scenarios where the applications are particularly sensitive to the link quality.
- **Auto-recovery when confronted with WWAN incidents**: The appropriate mechanism is applied to the nature of the fault and the defined service (WWAN module power reset, reregister in the WWAN network or switch to an alternative link).
- **Simultaneous connection to two WWAN networks from the same provider**: Simultaneous connection to a public APN (single cellular access point to Internet) and a private APN (cellular access point to the management VPN network).
- **Backup for cellular network from an alternative provider (double SIM)**: Automatic change of WWAN access provider based on the most diverse switch conditions (configurable).
- **WWAN advanced diagnosis**: Real time information on the WWAN statistics (signal power, access technology, statistics on traffic being processed, transfer rate, etc.) and historical evolution reports on the most relevant parameters.
- **Ethernet Subnets**: Implementation of a local subnet for each local application, isolated both at layer 2 (VLAN, MAC filtering) and layer 3 (IP filtering, SHCP server with subnetting) increasing their performance and simplifying remote management.
- **Optional WiFi with professional security (IEEE 802.1X)** for the WiFi terminals service.
- **Secure communications**: The router’s IPSec Client/Server, compatible with third-party VPN solutions, enriched with state of the art advanced IPSec features (certificates, extended authentication, Reverse-Route Injection, NAT-T, "Dynamic Multipoint VPNs", etc).
- **Perimeter security**: Powerful access lists mechanism to filter undesired IP traffic.
- **Advanced IP**: Wide range of advanced IP features supported to simply and transparently integrate the branch in the corporate VPN network.
- **Centralized management**: Powerful Teldat commands console and a wide range of management protocols supported to simplify remote operation tasks and to manage and maintain an extensive park of Teldat G1N routers, either through TeldaGES (Teldat router management platform) or from commercial network management platforms.

1 The Teldat G1N also has a second external SIM tray for situations where the most important issue is simplicity rather than protection.
**TECHNICAL SPECIFICATIONS**

**Hardware Characteristics**

**Hardware Architecture**
- Microprocessor: Motorola MPC8272
- Cache L1: 16 Kbytes instructions / 16 Kbytes data
- SDRAM memory: 64 Mbytes
- FLASH memory: 16 Mbytes
- NVRAM memory: 128 KBytes
- Embedded encryption processor
- 1 x Mini-PCI internal expansion for WiFi AP
- 7 LEDs indicating status
- 1 reset button

**Interfaces and connectors**
- 4 x 10/100 Fast Ethernet, RJ-45F
- 1 x 2.5G Interface (EDGE/GPRS)
- 2 x SIM trays (internal and external)
- 1 x SMA port for RF antennas
- 1 x Wireless-LAN (optional)
- 1 x port for local console, RJ-45F

**Console**
- RS-232 to 9600 bps (max. 115200 bps)
- 8 data bits, without parity, 1 stop bit (8N1)

**Power source**
- 12Vdc, jack connector
- External source Vac: 90v – 240v; 50/60Hz

**Switch 4 x FastEthernet**
- 10/100-BaseT Automatic detection
- Half/full duplex Automatic negotiation
- MDI / MDI-X Cross detection
- Ethernet V2 / IEEE 802.3
- LLC (802.2), ARP
- IEEE 802.1Q (VLAN)
- IEEE 802.1X
- Managed Switch:
  - EtherLike-MIB (RFC 2665)
  - SNMP-REPEATER-MIB (RFC 2108)
  - MAU-MIB (RFC 2668)
- 2 status LEDs per port

**Wireless LAN Interface**
- Option IEEE 802.11a/b/g
- Two external antennas that can be dismantled (SMA connectors)

**Environmental specifications**
- Operating temperature: 5°C - 55°C
- Relative humidity: 5% to 85%

**Dimensions and weight**
- Length x depth x height: 220 x 220 x 30 mm
- Approximate weight: 0.8 Kg

**Wireless-WAN Interface:**

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<thead>
<tr>
<th>Technologies</th>
<th>GPRS/EDGE mobile station class B</th>
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<tbody>
<tr>
<td>Frequency bands (MHz)</td>
<td>EGSM: 850/900/1800/1900 MHz</td>
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<tr>
<td>Simultaneous connection to two APNs</td>
<td>Yes</td>
</tr>
<tr>
<td>Base band processor</td>
<td>Qualcomm MSM6290™</td>
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<tr>
<td>Data services (PS)</td>
<td>GPRS multi-slot class 12</td>
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<td></td>
<td>GPRS Codification schemes: CS 1-4</td>
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<td></td>
<td>GPRS speed Uplink / Downlink (max.): 85.6 / 85.6 Kbps</td>
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<tr>
<td></td>
<td>EDGE multi-slot class 10</td>
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<tr>
<td></td>
<td>EDGE Modulation &amp; codification schemes: MCS 1-9</td>
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<td></td>
<td>EDGE speed Uplink / Downlink (max.): 118 / 236 Kbps</td>
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<tr>
<td>CSD</td>
<td>2.4, 4.8, 9.6, 14.4 kbps, not transparent, V.110</td>
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<tr>
<td>Remote awakening</td>
<td>Yes (sending an SMS)</td>
</tr>
<tr>
<td>Unstructured Supplementary Services Data (USSD)</td>
<td>Yes</td>
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</table>
Software Characteristics

**IP Protocol**
- IP, ARP, Proxy ARP
- Static IP routing, RIPv1/2, OSPFv2, BGP-4 & Policy Routing
- Quality of backup: Routing based on network quality measurements
- Multi-routing per IP packet (with static & dynamic routing)
- Weight balancing per TCP/IP session
- Multicast: IGMP, IGMP-proxy, MOSPF & PIM-SM [1]
- DHCP Client, server & relay
- DNS Client & proxy. DNS Cache. DNS updates (RFC2136)
- NAT/PAT/Port Mapping/NAT Exceptions
- PAT fire-walling
- Multiple addresses per interface
- Loopback Interfaces
- Bidirectional Forwarding Detection (BFD) protocol
- Compatible with HSRP protocol
- RFC 2281 VRRP – Virtual Router Redundancy Protocol
- VRF-Lite

**PPP & PPPoE Protocols**
- PPP (RFC 1661), PAP/CHAP, IPCP
- Multilink PPP
- Multi-Class Extension to Multi-Link PPP (RFC 2686)
- PPPoEoE, PPPoE Bridge + routing (PPPoE pass-through)
- Multilink PPP over PPPoE
- Renegotiation based on PADT

**Quality of Service (QoS)**
- Packet tagging (DiffServ) per interface, subinterface, protocol, port and MAC addresses
- Congestion control: FIFO, queue priorities, BRS proprietor system, WFQ
- Low Latency Queuing (LLQ)
- Traffic shaping
- Fragmentation in PPP & MPPP

**Security and VPNs**
- IPSec Client / Server, Fully parameterized system, compatible with third party IPSec peers
- IPSec security services: ESP & AH
- IPSec operation modes: Tunnel & transport
- Encryption: RC4, DES, 3DES & AES
- Authentication: SHA-1 & MD5
- IKE protocol
- ISAKMP, Oakley Groups 1, 2, 5, 15
- NAT-Traversal
- Reverse Route Injection (RRI)
- Digital certificates X.509v3, LDAP, PKIX, PEM, DER
- SCEP Protocol
- Tunnel End-point Discovery Protocol (TED)
- IPSec PMTU Discovery
- GRE & multi-GRE. RC4 encryption in GRE tunnels
- Next Hop Resolution Protocol (NHRP)
- Dynamic Multipoint IPSec VPNs (DMVPN)
- Gateway Encryption Transport VPNs (GET VPN)
- Radius Access Control (RFC 2138)
- L2TPv2: Client (LAC), Server (LNS), L2TP-CI, Pseudowire, Server
- IP advanced filters
- Advanced Firewall System (AFS)
  - Firewall Statefull
  - Advanced packet classification and tagging
  - URL and contents filtering

**Data compression**
- IPHC compression
- Van Jacobson & STA LZS compression algorithms

**Bridge**
- Bridge over PPP (BCP)
- STP “Spanning Tree Protocol” (IEEE 802.1d)
- RSTP "Rapid Convergence Spanning Tree Protocol"(IEEE 802.1w)
- Multiple bridge domains
- Simultaneous Bridging & Routing
- IEEE 802.1p CoS ("Class of Service")
- PVST ("Per VLAN Spanning Tree Protocol") [1]
- Source Routing, MAC & NetBIOS filtering

**Specific 3G functions**
- Automatic “Hand-over”
- Wireless-WAN service passive fault detection
- Active detection of dropped interfaces based on polling
- Remote wake-up with GSM call or SMS for 3G services on demand
- RF interface advanced monitoring and in real time
- Double SIM tray connected with multiple selection criteria:
  - Signal level
  - WWAN technology available (GPRS, HSPA, etc.)
  - IP link quality (packet error rate, latency, jitter)
  - Based on preferential connection timetables
- Dual PDP context for simultaneous connections to two APNs
- OTA WWAN module firmware updating

**Specific Wireless LAN functions**
- Selectable transmission power
- Manual or automatic speed selection
- Turbo Mode (108 Mbps)
- 802.11i, WPA, WPA2
- EAP, EAPOL
- Authentication (open, shared, WPA)
- Encryption (AES, TKIP, WEP)
- ESSID
- MAC filtering
- Quality of Service (QoS)
- AIFS, CWmin, CWmax

**Management**
- Teldat console commands, telnet & SSH
- SNMPv1/2/3, MIB2 & Teldat-MIB
- Events Logging System
- Netflow V5 and V9
- Syslog Client
- NTP Protocol
- DynDNS Client
- Software FTP & TFTP, configuration & BIOS updating
- Internal protocol analyzer, compatible with WireShark
- Factory set dump switch
- Radius Accounting (RFC 2139)
- Integrated in Teldages (Teldat professional management platform)

[1] Feature under development
[2] The functions related to IPSec need an IPSec license
[3] The WLAN features are applied to routers that support Wireless-LAN
**ORDER INFORMATION**

<table>
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<tr>
<th>Article Cod.</th>
<th>Description</th>
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<tr>
<td><strong>Router</strong></td>
<td><strong>TELDAT G1N: IP ROUTER, 1 EDGE/GPRS/GSM/EDGE + 1 SWITCH 4 PORTS ETH 10/100 + HW ENCRYPTION + WIFI OPTION (NOT INCLUDED)</strong></td>
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<tr>
<td>RWRGH5</td>
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